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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MOTOROLA, INC. 1303 EAST ALGONQUIN ROAD IL01/3RD SCHAUMBURG, IL 60196			EXAMINER HASHEM, LISA	
			ART UNIT 2614	PAPER NUMBER
			NOTIFICATION DATE 07/09/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docketing.Schaumburg@motorola.com  
APT099@motorola.com

<b>Office Action Summary</b>	<b>Application No.</b> 09/933,364	<b>Applicant(s)</b> GAILUS ET AL.	
	<b>Examiner</b> Lisa Hashem	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-9,11-18,20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-9, 11, 13-18, 20, and 22 is/are rejected.
- 7) ☐ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Reopening of Prosecution***

1. In view of the Appeal Brief filed on 1-29-2007, PROSECUTION IS HEREBY REOPENED because Applicant's arguments are persuasive. A new action is set forth below.
2. To avoid abandonment of the application, appellant must exercise one of the following two options:
  - (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
  - (2) request reinstatement of the appeal.
3. If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
5. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, because the claim includes a single step claim, i.e. where a step recitation does not appear in combination with another recited element of steps '...moving a pole in the loop frequency response using the at least one adjustable pole element yielding a change in the closed loop frequency response...'. A single step claim which covers every conceivable steps for achieving the stated purpose is held

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nonenabling for the scope of the claim because the specification discloses at most only those steps known to the inventor.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 discloses the following: 'substantially all the components'. This recitation is vague because it is not clear how many components are considered 'substantial'.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 4-9, 11, 13-18, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 5,722,056 by Horowitz et al, hereinafter Horowitz (Figs. 4-7 are omitted from the patent) in view of 'Noise Performance of a Cartesian Loop Transmitter', by Kenington et al, hereinafter Kenington (submitted in IDS by Applicant on 8-20-2001).

Regarding claim 1, Horowitz discloses in an electrical device (Fig. 2) generating a variable output signal, a feedback loop for adjusting the variable output signal (Fig. 2), the feedback loop having an input (Fig. 2: 10-14) for receiving an input signal, an output (Fig. 1, 50) for outputting the variable output signal and a loop bandwidth associated with a forward

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path and a feedback path of the feedback loop (col. 1, lines 5-53; col. 3, lines 24-43), the feedback loop comprising:

a power amplifier (Fig. 2, 36) coupled to the output of the feedback loop in the forward path of the feedback loop;

at least one adjustable zero element (Fig. 1, 26) coupled between the input of the feedback loop and the power amplifier;

at least one adjustable pole element (Fig. 1, 26) coupled between the input of the feedback loop and the power amplifier, wherein the at least one adjustable zero element and at least one adjustable pole element are inherently operable to change the loop bandwidth of the feedback loop (col. 6, line 57 – col. 8, line 7).

Horowitz briefly discloses the mention of the AGC circuitry including zeros and poles that is operable to change the loop bandwidth of the feedback.

Kenington discloses a Cartesian feedback loop (Fig. 1) and further discloses at least one adjustable zero element coupled and at least one adjustable pole element around the feedback loop, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop (see Table 1; Fig. 11; page 467-468, section II; page 474, section IV -> ‘...A more accurate model would need to include the complex effects of the poles and zeros around the loop, particularly those provided by the limited gain-bandwidth product of the operational amplifiers and those of the baseband sections of the up and downconverter elements, if appropriate...’.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feedback loop of Horowitz to include information regarding the zeros and poles operable to change the loop bandwidth of the feedback as taught by Kenington. One of ordinary skill in the art would have been lead to include more information on the zeros and poles located in the Cartesian feedback loop to indicate how the adjustments or changes of the zeros and poles effect the closed loop bandwidth and adjust the stability properties of the feedback loop.

Regarding claim 2, the feedback loop of claim 1, wherein Horowitz further discloses the at least one adjustable zero element (Fig. 2, 26) (col. 6, line 57 – col. 8, line 7).

Regarding claim 4, the feedback loop of claim 1, wherein Horowitz further discloses the at least one adjustable pole element is in the forward path of the feedback loop (Fig. 2, 26) (col. 6, line 57 – col. 8, line 7).

Regarding claim 5, the feedback loop of claim 4, wherein Horowitz further discloses the at least one adjustable zero element is in the forward path of the feedback loop, the feedback loop further comprising: a mixer (Fig. 2, 61) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier; and a mixer (Fig. 2, 62) in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop (col. 3, lines 24-43).

Regarding claim 6, the feedback loop of claim 5, wherein Horowitz further discloses the feedback loop is used as part of a radio transmitter (see Abstract; col. 1, lines 5-16).

Regarding claim 7, the feedback loop of claim 1, wherein Horowitz further discloses the feedback loop is a cartesian feedback loop (see Abstract; col. 1, lines 5-16; col. 3, lines 24-43).

Regarding claim 8, the feedback loop of claim 1, wherein Horowitz further discloses the adjustable pole element is a circuit comprising a plurality of elements having impedance that can be selectively coupled to other elements of the circuit (Fig. 2, 26; col. 6, line 57 – col. 8, line 7).

Regarding claim 9, the feedback loop of claim 1, wherein Horowitz further discloses the at least one adjustable pole element and the at least one adjustable zero element are substantially contained within an integrated circuit (Fig. 2, 26; col. 6, line 57 – col. 8, line 7).

Regarding claim 11, the feedback loop of claim 1, wherein Horowitz further discloses the at least one adjustable pole element comprises two adjustable pole elements (Fig. 2, 26; col. 6, line 57 – col. 8, line 7).

Regarding claims 13, 14, and 17, please see claims 1, 8, 1, and 6, respectively.

Regarding claim 16, the method of claim 15, wherein Horowitz further disclose the step of moving a zero is accomplished by adjusting an amplifier with an adjustable gain (col. 3, lines 24-43; col. 3, line 59 – col. 4, line 6; col. 4, lines 13-26; col. 7, lines 11-19).

Regarding claim 18, Horowitz further discloses an integrated circuit implementing substantially all the components of a feedback loop with adjustable frequency response, the integrated circuit the feedback loop of claim 1 (Fig. 2; col. 3, lines 24-43).

Regarding claim 20, please see the rejections to claims 1 and 5 above.

Regarding claim 22, please see the rejection to claim 1 above.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1, 2, 4-9, 11, 13-18, 20, and 22 are rejected under 35 U.S.C. 102(e) as being U.S. Pat. No. 6,859,097 by Chandler.

(Note: Chandler is considered prior art based on the date of filing of the PCT (May 14, 2001) based on being filed after November 29, 2000, designating the US, and being published in English by WIPO; See MPEP 701 below: In order to rely on an international filing date for prior art purposes under 35 U.S.C. 102(e), the international application must have been filed on or after November 20, 2000, it must have been designated the U.S., and the international publication under PCT Article 21(2) by WIPO must have been in English. If any one of the conditions is not met, the international filing date is not a U.S. filing date for prior art purposes under 35 U.S.C. 102(e)).

Regarding claim 1, Chandler discloses in an electrical device (Fig. 13) generating a variable output signal ( $Y(s)$ ), a feedback loop for adjusting the variable output signal ( $H(s)$ ), the feedback loop having an input ( $X(s)$ ) for receiving an input signal, an output ( $Y(s)$ ) for outputting the variable output signal and a loop bandwidth associated with a forward path and a feedback path of the feedback loop (col. 1, lines 59-67), the feedback loop comprising:



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a power amplifier ( $A_2(s)$ ) coupled to the output of the feedback loop in the forward path of the feedback loop;

at least one adjustable zero element ( $H_2^{-1}$ ) coupled between the input of the feedback loop and the power amplifier;

at least one adjustable pole element ( $H_1, H_2$ ) coupled between the input of the feedback loop and the power amplifier, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 2, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable zero element ( $H_2^{-1}$ ) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 4, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable pole element ( $H_1, H_2$ ) is in the forward path of the feedback loop ( $H_2^{-1}$ ) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 5, the feedback loop of claim 4, wherein Chandler further discloses the at least one adjustable zero element is in the forward path of the feedback loop, the feedback loop further comprising: a mixer (between the resonator and the power amplifier) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier; and a mixer (between  $X(s)$  and  $F(s)$ ) in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 6, the feedback loop of claim 5, wherein Chandler further discloses the feedback loop is used as part of a radio transmitter (col. 1, lines 4-18).

Regarding claim 7, the feedback loop of claim 1, wherein Chandler further discloses the feedback loop is a cartesian feedback loop (col. 2, lines 1-12; Fig. 13).

Regarding claim 8, the feedback loop of claim 1, wherein Chandler further discloses the adjustable pole element is a circuit comprising a plurality of elements having impedance that can be selectively coupled to other elements of the circuit (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 9, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable pole element and the at least one adjustable zero element are substantially contained within an integrated circuit (Fig. 13; col. 7, lines 32-54).

Regarding claim 11, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable pole element comprises two adjustable pole elements ( $(H_1, H_2)$ ; col. 7, lines 32-54).

Regarding claim 13, Chandler discloses in a feedback loop (Fig. 13) comprising an input ( $X(s)$ ) for receiving an input signal, an output ( $Y(s)$ ) for outputting a variable output signal, a power amplifier ( $A_2(s)$ ) coupled to the output of the feedback loop in a forward path of the feedback loop, at least one adjustable zero element ( $H_2^{-1}$ ) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop ( $H(s)$ ) (col. 1, lines 59-67), and at least one adjustable pole element ( $H_1, H_2$ ) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop ( $H(s)$ ) (col. 1, lines 59-67), the feedback loop further having a loop and a closed loop frequency response

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associated with the forward path and a feedback path of the feedback loop, the loop frequency response having at least one pole and at least one zero and the closed loop frequency response being characterized by a closed loop bandwidth (col. 7, lines 32-54), a method comprising the steps of:

moving a pole in the loop frequency response using the at least one adjustable pole element yielding a change in the closed loop frequency response (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 14, the method of claim 13, wherein Chandler further disclose the step of moving a pole is accomplished by switching among a plurality of elements having different impedances (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 15, the method of claim 13, wherein Chandler further disclose the step of: moving a zero in the loop frequency response using the at least one adjustable zero element yielding a change in the closed loop frequency response (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 16, the method of claim 15, wherein Chandler further disclose the step of moving a zero is accomplished by adjusting an amplifier with an adjustable gain (col. 1, lines 41-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 17, the method of claim 13, wherein Chandler further discloses the power amplifier amplifies the input signal so that it can be transmitted over a radio channel (col. 1, lines 4-18 and lines 59-67; col. 7, lines 32-54).

Regarding claim 18, Chandler further discloses an integrated circuit implementing substantially all the components of a feedback loop with adjustable frequency response, the integrated circuit the feedback loop of claim 1 (Fig. 13; col. 7, lines 32-54).

Regarding claim 20, Chandler discloses in a feedback loop (Fig. 13) having an input ( $X(s)$ ) for receiving an input signal, an output ( $Y(s)$ ) for outputting a variable output signal and a loop bandwidth associated with a forward path and a feedback path of the feedback loop (col. 7, lines 32-54)), the feedback loop comprising:

a power amplifier ( $A_2(s)$ ) coupled to the output of the feedback loop in a forward path of the feedback loop;

at least one adjustable zero element ( $H_2^{-1}$ ) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop ( $H(s)$ ) (col. 1, lines 59-67);

at least one adjustable pole element ( $H_1, H_2$ ) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop ( $H(s)$ ) (col. 1, lines 59-67);

a first mixer (between the resonator and the power amplifier) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier;

and a second mixer (between  $X(s)$  and  $F(s)$ ) in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 22, Chandler discloses in a feedback loop (Fig. 13) comprising an input for receiving an input signal ( $X(s)$ ), an output for outputting a variable output signal ( $Y(s)$ ), a power amplifier coupled to the output of the feedback loop in a forward path of the feedback

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loop ( $A_2(s)$ ), at least one adjustable zero element ( $H_2^{-1}$ ) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop, and at least one adjustable pole element coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop, and at least one adjustable pole element ( $H_1, H_2$ ) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop ( $H(s)$ ) (col. 1, lines 59-67), the feedback loop further having a loop and a closed loop frequency response associated with the forward path and a feedback path of the feedback loop, the loop frequency response having at least one pole and at least one zero and the closed loop frequency response being characterized by a closed loop bandwidth (col. 7, lines 32-54), a method comprising the steps of:

moving a pole in the loop frequency response using the at least one adjustable pole element yielding a change in the closed loop frequency response; and moving a zero in the loop frequency response using the at least one adjustable zero element yielding a change in the closed loop frequency response (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

#### ***Allowable Subject Matter***

12. Claim 12 is objected to as being dependent upon a rejected base claim 1, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Horowitz in view of Kenington do not disclose the structure and locations of the elements as disclosed in claim 12.

#### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see PTO-892 attached.

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- U.S. Pat. No. 6,947,712 by Sun et al discloses a Cartesian feedback loop to linearize the output of a power amplifier as shown in Figures 1 and 2. Sun et al clearly teaches a similar invention to the instant application, however it is not prior art based on its filing date

14. Any response to this action should be mailed to:

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**Or faxed to:**

(571) 273-8300 (for formal communications intended for entry)

**Or call:**

(571) 272-2600 (for customer service assistance)

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa Hashem whose telephone number is (571) 272-7542. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on (571) 272-7547. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-2600.

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16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

lh

June 21, 2007



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